



# Appendix A

## Research and Theory

The following research may help the educator design activities with students. Further research is available from web sites that are cited in this document.

### Multiple Intelligences

In *Frames of Mind: A Theory of Multiple Intelligences*, Howard Gardner (1983) wrote that a study of children's growth and development suggests a number of distinct intelligences (related to patterns of thinking or thinking styles).

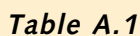
- ▶ **Linguistic:** Sensitivity to the order and meanings of words; sounds, rhythms, inflections, and meters of words; and the function of words: to excite, convince, stimulate, convey information, or simply to please.
- ▶ **Logical-mathematical:** The ability to appreciate the actions performed upon objects (confronting, ordering/reordering) and assessment of quality relations among those actions; statements/propositions about actual or potential actions and the relationships among those statements.
- ▶ **Spatial:** The capacity to perceive the visual world accurately; to perform transformations and modifications upon one's initial perceptions; and to be able to recreate aspects of one's visual experience, even in the absence of relevant physical stimuli. Sensitivity to patterns, forms, and the whole.
- ▶ **Bodily-kinesthetic:** Use of the body as an object to express self and feelings; aspirations/use of body parts (including hands) to arrange, transform, and manipulate objects in the world.
- ▶ **Musical:** The ability to discern meaning and importance in sets of pitches rhythmically arranged and also to produce such metrically arranged pitch sequences as a means of communicating to other individuals.
- ▶ **Interpersonal:** The external aspect of a person: the ability to notice and make distinctions among other individuals—in particular, their moods, temperaments, motivations, and intentions.

- ▶ **Intrapersonal:** The internal aspects of a person: the capacity to effect discriminations among feelings, range of affects, or emotions, and to label them, enmesh them with symbolic codes, and draw upon them to understand and guide one's own behavior.
- ▶ **Naturalist:** The ability to identify and classify patterns in nature. The person has the ability to relate to the surroundings and the role each part of your surroundings play.
- ▶ **Existential:** The sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why do we die, and how did we get here.

### Taxonomy of Instructional Verbs and Tasks

(reprinted from the *New Jersey Visual and Performing Arts Curriculum Framework* [Winter 1999])

The words we use to instruct in the classroom should be carefully chosen. Lesson plans and instruction should be scrutinized for the use of appropriate, instructive verbs and tasks that elevate a child's cognitive functioning. Bloom's taxonomy of thinking skills identifies some of these instructional verbs and tasks/products and places them in a five-tiered table (with *recall* as the lowest level and *evaluation* as the highest level). Since the standards require that all students be challenged to reach their maximum potential, the higher- or lower-functioning students can be assigned higher- or lower-level task challenges using Bloom's taxonomy...("A Taxonomy of Educational Objectives" conference presentation by Benjamin S. Bloom, 1949).



RECALL*		APPLICATION		ANALYSIS	
Verbs	Products	Verbs	Products	Verbs	Products
list	label	show	photograph	summarize	questionnaire
identify	name	apply	illustration	abstract	survey
locate	list	translate	diagram	classify	report
memorize	definition	illustrate	collection	dissect	graph/chart
review	fact	record	map	compare	outline
match	test	teach	puzzle	deduce	diagram
reproduce	reproduction	construct	model	order	conclusion
name	recitation	demonstrate	diary	investigate	list
read			report	differentiate	plan
recall			lesson	categorize	summary
				separate	catalog
SYNTHESIS			EVALUATION		
Verbs	Products	Verbs	Products	Verbs	Products
compose	film	decide	conclusion	decide	conclusion
imagine	formula	rate	judgment	rate	judgment
infer	invention	evaluate	panel	evaluate	panel
hypothesize	poem	dispute	opinion	dispute	opinion
invent	prediction	discuss	verdict	discuss	verdict
create	project	verify	scale	verify	scale
estimate	new game	judge	value	judge	value
produce	story	grade	recommendation	grade	recommendation
forecast	machine	choose		choose	
design	media	assess		assess	
predict		select		select	
*knowledge/comprehension					

E. Paul Torrance (1962) in *Guiding Creative Talent* described student behaviors and cognitive skills identified with the creative thinker. The factors and behaviors below are characteristic of creative thinkers.

- ▶ **Fluency and Flexibility:** Thinks about many things; generates lots of ideas; is a divergent thinker; creates many characters; sees various viewpoints; and sees things in a humorous perspective.
- ▶ **Originality:** Is unique and intuitive; comes up with original ideas; finds clever solutions to problems; and suggests unique methods and novel innovations.
- ▶ **Elaboration:** Embellishes jokes and stories; adds detail; expands ideas; builds on; embroiders.
- ▶ **Risk Taking:** Is courageous and daring; experiments and explores possibilities; risks failure; and tries new approaches and tasks.
- ▶ **Complexity:** Organizes unrelated data; recognizes relationships; restructures; and encapsulates visual and verbal presentations.
- ▶ **Curiosity:** Wonders; follows hunches; ponders outcomes; pursues inquiry; questions; and puzzles over people's reactions.
- ▶ **Imagination:** Fantasizes; daydreams; thinks up characters and story lines; visualizes change; and imagines images and events.